



ANACONDA Industries

Date: October 28, 1980

Subject: Description of Samples Sent to Anaconda Research



From/Location: N.A. Bérubé

To/Location: D.R. Krause

Background

Anaconda Research is interested in helping us find a way to clean some of the recycle streams to the potlines. Initial tests will be aimed at reducing silicon and iron levels in the crushed bath, basement sweepings, and reacted ore.

Discussion

This initial program will have two separate areas researched. One area pertains strictly to the materials we recycle out of the basements and the second area is the dry scrubber alumina (reacted ore).

Four samples have been prepared and sent to Mr. Bill Davis at Tucson under the following designations:

	<u>Description</u>	<u>Desired Element(s) Removed</u>
Sample A -	Basement Sweepings	Iron and Silicon
Sample B -	Crushed Bath	Silicon
Sample C -	Basement Bath & Debris	Iron and Silicon
Sample D -	Reacted Alumina	Iron

Samples A, B, and C are for the program to reduce contaminants in the recycle streams to the potlines. Sample D is to be used for research on iron removal from the reacted alumina.

A flowsheet showing the basic recycling operation at the plant and the relative location the samples were taken is shown in Figure 1. A brief description of this recycling operation follows.

Materials; reacted ore, bath spill-outs, nuts, bolts, welding rods and residues, hoses, wood, anode carbon, etc. accumulate in the potlines basements as a routine part of the production operation. Current yearly estimates are 15 million pounds of ore and four million pounds of bath mixed with all the above listed materials.

Currently we are dumping a mixture of all this material on a quarter inch mesh screen. The ore and other fines fall through the screen and are removed to a storage silo. This material comprises Sample A. From the silo, potlines takes the sweepings and returns them to the pots. There is a small electromagnet over the conveyor belt in the chemical silo complex, but it is fairly ineffective. The ore depth on the conveyor belt runs as much as 2½ inches.

The oversize material from screening operation is hauled from the basements as a jumble of bath and debris and is stored on outdoor pads until it can be hand picked and the bath crushed. Sample C was taken from one of the outdoor piles.

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This material is taken from the pad and dumped into a hopper. From the hopper, it is taken by a conveyor belt under water sprays and past a picking station. Laborers pick the aluminum out for salvage and any rocks, cement, sticks, iron, briquets, etc., that they have time to grab. The material continues up the conveyor to a duplex gravel crusher, where it is size reduced to less than one quarter inch mesh. The belt that takes the crushed product to the dump truck passes under a permanent magnet, which removes any iron contamination that has an appreciable mass. Material that enters the dump truck is hauled back to the Potlines, where it is fed back into the pots. Water is used to control dusting, but it is undersirable. Wet bath is a safety hazard in the pots and special precautions are taken to utilize this material. Dry crushed bath would be a great improvement over present conditions. Sample B was removed from a covered bin inside the Potline building.

Sample D, the reacted alumina, was removed from one of the ore trucks in the Potlines. An explanation of the process that gives us reacted alumina follows:

New alumina is received at the Plant by rail. This material is stored in silos until it can be fed to the ALCOA dry scrubbers. New alumina has been found to contain small amounts of iron contamination. In the dry scrubber, Potline primary gasses are passed through a fluidized bed of new alumina. The alumina reacts with the gasses to remove fluorides and other contaminants. This process appears to also be increasing the iron contamination of the alumina. The reacted ore leaves the dry scrubber and is transported in ore trucks into the Potlines.

N. A. Be'rube'

*N. A. Be'rube'*

NAB/lrb

CC: T.F. Payne

Anaconda Research  
Bill Davis